A NATIONAL WILDERNESS PRESERVATION SYSTEM DATABASE:

BENEFITS, LIMITATIONS, AND FUTURE NEEDS*

Shannon Meyer and Peter Landres

Aldo Leopold Wilderness Research Institute
Rocky Mountain Research Station
USDA Forest Service
Missoula, MT

* Citation:
Meyer, S., and P. Landres. 2000. A National Wilderness Preservation System Database: Benefits, Limitations, and Future Needs. International Journal of Wilderness 6(1):13-18.

Abstract: As federal wilderness agencies move from issues of allocation to management, information about the status and trends of wilderness character and its management becomes increasingly important. This article discusses the organization, content, and use of the recently published database, *AA National Wilderness Preservation System Database: Key Attributes and Trends, 1964-1998.@* Future needs and issues related to wilderness information are discussed. We stress the need for interagency coordination and cooperation in developing shared wilderness information goals, information to be reported from every wilderness, standard database format and structure, and administrative infrastructure to develop and maintain this shared information.

Introduction

When the National Wilderness Preservation System (NWPS) was established by the Wilderness Act of 1964, it contained 9.1 million acres of wilderness in 54 Forest Service areas. Now, in 1998, the NWPS is composed of over 104 million acres in 625 wildernesses distributed across 44 states and managed by four federal agencies (Bureau of Land Management [BLM], Forest Service, Fish and Wild Service [FWS], and National Park Service [NPS]). With this growth in size and complexity, and the constant legislative and administrative changes to the system, there is an increasing need for a single, accurate, and up-to-date source of information about all wildernesses within the NWPS. The purpose of this article is to discuss the construction, content, and use of the recently published database, AA National Wilderness Preservation System Database: Key Attributes and Trends, 1964-1998@ (Landres and Meyer 1998, hereafter referred to as the NWPS Database). We discuss the benefits of this NWPS Database compared to previous compilations, as well as its limitations. Finally, we address future needs for wilderness information. Specifically we discuss the need for an interagency commitment to developing shared wilderness information goals, core information that could be reported from every wilderness, database format and structure, and the administrative infrastructure needed to develop and maintain this shared information.

The Need For a New NWPS Database

There are several reasons why a new, up-to-date compilation of information about the NWPS is needed. First, the previous wilderness database was ridden with errors. In the late 1980s, individuals in the Washington Office of the BLM had the foresight and commitment to create the first agency-developed compilation of information on the entire NWPS. This database became the standard source of information on the NWPS used by the four agencies and many private organizations. Although the BLM=s database has been periodically updated, it still contains errors due to inaccurate reporting by the individual agencies, inconsistent criteria for defining the types of information supplied by the agencies, and legislative and administrative changes to the NWPS. In addition to the BLM=s database, other compilations of NWPS information (Reed 1987, 1988; Browning and others 1988; Rosenberg 1994) are now out-of-date. Second, with four independent agencies and continuous legislative and administrative changes to the NWPS, there is a lack of consistency and accuracy in reporting and maintaining wilderness information. Third, there is substantial variation in the quality and types of information reported by the agencies, largely driven by differences in their institutional goals and missions (Landres and others 1998). Finally, with expanding socio-economic pressures to develop currently undeveloped federal lands, there is increasing interest and need from public and private sectors for a single source of reliable information on the key attributes of wildernesses nationwide.

A National Wilderness Preservation System Database

The NWPS Database (Landres and Meyer 1998) provides readily accessible and accurate basic descriptive information for every wilderness in the National Wilderness Preservation System. For each wilderness the database contains:

- legally correct name
- state(s) in which it occurs
- administering agency or agencies
- administrative units,
- applicable public laws and dates of enactment
- current acreage and historical acreage
- acreage added or subtracted by each wilderness law

The information included in the NWPS Database is organized in a variety of formats to facilitate different users= needs (Table 1). In addition to its availability in printed format, the NWPS Database is accessible on the internet at http://www.wilderness.net/nwps. This site allows users to sort, query, and generate customized reports.

The NWPS Database is based on the most current, accurate, and legally defensible information available at the time of its publication. The general sources for data include legal and administrative documents, including Congressional documents, agency publications, and personal communications with agency personnel. To verify wilderness names, we relied upon the legislation establishing the wilderness and the United States Code (Title 16). In some cases, the name that has commonly been used for a wilderness is not legally correct due to either a misspelling or colloquial usage. We used agency publications and wilderness specialists for information on the administration and size of wilderness units.

The NWPS Database distinguishes between historical acreage, which is the acreage listed in the establishing legislation, and current acreage, which is supplied by the administering agencies. Although the original public law acreage is important from a historical perspective, the administrative acreage is more useful for current assessments. The public law acreage is usually only an approximation. After an area becomes part of the NWPS, it is eventually mapped by the managing agency and the public law acreage is updated with this more accurate information. These current acreage numbers were gathered from each agency=s official publications then verified by wilderness specialists within that agency.

The NWPS Database also examines special cases that deviate from the general sources listed above. While the Database primarily uses the legislated wilderness name, exceptions have been made in certain cases. These include name changes made by the Board of Geographic Names (BGN), firmly established administrative changes, and legislative errors. For example, there was confusion over the spelling of the Anaconda Pintler Wilderness in Montana which was finally corrected by the BGN in 1978. In addition, a legislative error gave the same name, Wambaw Swamp, to two distinct Forest Service wildernesses in South Carolina. The NWPS Database adheres to the administrative usage by listing both a Little Wambaw Swamp Wilderness and a Wambaw Swamp Wilderness. Agency changes of administrative names are included in the

NWPS. This generally applies to the combination of National Forests such as the Beaverhead-Deerlodge National Forest in Montana.

We also explain differences between information in previous databases and the NWPS Database. In most cases the differences are the result of updated acreages. However, within previous databases there are a number of wrong names, legislated changes, and mistaken units. For example, earlier compilations (Reed 1987, Rosenberg 1994, and the BLM=s database) use misspelled names such as Dome Land instead of Domeland, and Mount Wrightson instead of Mt. Wrightson. In addition, in the years since the Wilderness Act was passed, there have been nine legislative name changes of existing wildernesses, beginning in 1984 with the changing of the Minarets Wilderness to the Ansel Adams Wilderness (P.L. 98-425) to the 1997 law renaming the Everglades Wilderness after its long-time advocate, Marjory Stoneman Douglas (P.L. 105-82).

Information provided in the NWPS Database accurately describes the current state of the wilderness system as of mid-June 1998. These data allow the analysis of general trends across the NWPS. The NWPS Database publication summarizes trends in the historical and geographical distribution and designation of wilderness. Figures 1 and 2 shown here, illustrate the dramatic difference between the number of wilderness areas and acres designated yearly in each agency. These figures show the different size of each agency=s wilderness holdings, as well as the rate and timing of wilderness designation within each agency. The percentage of each agency=s total acreage that is designated wilderness is shown in Figure 3. This figure clearly demonstrates the dominance of wilderness in the National Park Service=s land base. Other trends analyzed in the NWPS Database are the percentage of wilderness in different regions, the size class distribution of wildernesses in the NWPS, and the percentage of each state that is in wilderness.

Benefits of the NWPS Database

The NWPS Database provides a starting point for ongoing wilderness data collection. Our intent with this Database was to create a framework of accurate information which could be updated and upon which additional layers of data could be overlaid. This compilation is both easily accessible and accurate. Its availability in both printed and electronic formats allows access by all types of users with a variety of needs. Individuals without access to the internet will find the range of printed spreadsheets useful. If this database is widely used, the consistency of wilderness information will increase. Rather than building on outdated and inaccurate information, new wilderness data sets will be based on data that, as of 1998, were verifiably correct and consistent among agencies.

Limitations of the NWPS Database

Because wilderness information is in a constant state of flux, the NWPS Database can only provide a snapshot of the NWPS as it stood in mid-1998. Since the passage of the Wilderness Act of 1964, 101 wilderness laws have been passed, each altering the wilderness system. On a continual basis new wilderness areas are created, names are changed, and boundaries redrawn. An example that illustrates the rate of change and need for updating is that since the publication of the NWPS Database in October 1998, a new wilderness was established. The Opal Creek Wilderness in Oregon was established by Public Law 104-333 in 1996 under the stipulation that

certain conditions take effect within 2 years time. Two years later those conditions were met and this new wilderness officially became part of the system. The 20,724 acre Opal Creek Wilderness includes a 7,512 acre portion of the Bull of the Woods Wilderness and adds 13,212 new acres to the NWPS. The internet database has been updated with this change but a month after publication of the printed version the NWPS Database was out of date.

Future Needs

The discussion above illustrates that a static database will not be sufficient to meet the wilderness community=s ongoing needs for accurate information. To be useful, NWPS information must not only be updated on a routine basis, it must also be accepted and shared between all four wilderness management agencies. Future uses and benefits of NWPS information depend on a database that is accurate, up-to-date, and comprehensive. Satisfying these three criteria will require interagency commitment to (1) develop shared database goals; (2) develop a set of core information that allows tracking the full set of trends in wilderness and wilderness management; (3) develop a standard database format and structure; and (4) provide the infrastructure of time, personnel, funding, and the formal reporting mechanisms both within and among agencies, to develop and share this information. These future needs are examined briefly below.

Shared Goals

Only by discussing their common interests and needs will agencies develop a set of shared goals for NWPS information.. In addition to their unique information needs, the agencies also share many information needs and reporting requirements, such as annual reporting to Congress as mandated by the Wilderness Act of 1964 (Sec. 7). Other shared goals include the need for accurate and comprehensive information to allow national-level administrators, policy-makers, and decision-makers to assess trends in wilderness conditions and the effectiveness of wilderness management. The need for system-wide, cross-jurisdictional information will only increase as socioeconomic pressures to develop unique wilderness and surrounding lands increase. In an era of declining budgets and personnel, interagency collaboration and cooperation will also, in the long run, streamline reporting efforts. Fortunately, the agencies are currently moving to discuss their common goals for NWPS information.

Core Variables on Wilderness Character and Management

Once shared goals are determined, the agencies need to decide what core information will be monitored on a regular basis. For a wilderness database to be useful, it must provide information on trends over time of the basic attributes of wilderness character and its management. Wilderness character includes both ecological and social conditions, while wilderness management refers to the decisions and actions taken by the agencies to implement their wilderness legislative mandates.

A potentially significant impact of gathering core information is the increased pressure on already limited local budgets and personnel for collecting and reporting information that primarily benefits national assessments and national policy-makers. The information derived from core variables must, to the fullest extent possible, be of direct benefit to the local wilderness. Landres (1994) discusses this and other tradeoffs of using standardized core variables in monitoring programs, such as the importance of sensitivity to local needs and

concerns, and the need for carefully selecting variables that can be aggregated from the local to the national level without distortion. In addition, putting this information into a geographic information system will be increasingly important for inventorying and monitoring, management planning, policy setting, research, and consensual decision-making (Franklin 1994). Wilderness managers would benefit by having readily accessible information on a variety of ecological and social attributes to develop plans and assess the effectiveness of their decisions and actions. National-level administrators and policy-makers would benefit by being able to compile information on ecological and social trends in wilderness regionally and nationwide.

Standard Format

Once core variables are chosen, a shared format for compiling information is necessary to share and use this information within and across agencies. This format includes developing standard definitions, as well as standard methods for collecting and reporting information. If the information is not developed using shared, standardized definitions and methods, it may be of little or no use. For example, in an effort to comply with the annual reporting requirement stated in the Wilderness Act of 1964, the Forest Service, in 1993, adopted standard wilderness reporting requirements. However, no guidelines were published to accompany these reporting requirements, and agency personnel struggled to interpret what information they should report. With no guidance, different types of information were reported by different offices for a single type of requested information, resulting in confusion and a reluctance to spend the time and effort needed to report this information. These intra-agency problems will likely be compounded across agencies unless a shared format for compiling information is developed and used.

Administrative Infrastructure

Determining shared goals, core variables, and formats are useless without an administrative infrastructure to support this effort. This infrastructure includes the commitment of personnel, time, and adequate funding. It also necessitates establishing formal communication mechanisms within and among agencies to develop, share, and use this information. The need for this type of institutional support has long been recognized in monitoring programs (e.g., see Lee 1993 and references therein). However, programs that provide long-term benefits are difficult to support on annual budget cycles, in agencies confronted with routine crises, and in agencies that do not recognize the need for monitoring information. For these reasons, formal mechanisms for using the information provided by these types of monitoring programs are needed to ensure their continued administrative support and the support of the people collecting the information.

Conclusions

The wilderness community has benefitted greatly from the BLM=s pioneering efforts to compile wilderness information. Now, with publication of the NWPS Database, there is an opportunity to build upon a new base of solid information. As the wilderness agencies move from issues of allocation to issues of management, information about the status and trends of wilderness character and its management becomes increasingly important. Developing a single, current, and comprehensive database for the NWPS will require the agencies to address the future needs and issues discussed above, and balance the benefits of a single NWPS database against unique agency needs, cultures, and attitudes of territoriality.

Acknowledgments

We thank all the agency personnel who graciously gave their time and effort to support this database effort and verify the information (sometimes over and over again) contained in the NWPS Database. We also thank Greg Aplet, Chris Ryan, and Wayne Freimund for their critical reviews of this paper.

The Authors

Shannon Meyer is a policy analyst at the Rocky Mountain Research Station=s Aldo Leopold Wilderness Research Institute in Missoula, Montana. Ms. Meyer holds a M.S. degree in Environmental Policy from the University of Montana, and a B.A. degree in Environmental Studies and Government from Bowdoin College. She is active in developing policy frameworks for improving the management of wilderness.

Peter Landres is Research Ecologist at the Rocky Mountain Research Station=s Aldo Leopold Wilderness Research Institute in Missoula, Montana. Dr. Landres holds a Ph.D. degree in Ecology and Biology from Utah State University, and a B.S. degree in Natural Science from Lewis and Clark College. He is active in developing the knowledge to improve the ecological management of wilderness.

References

Browning, J.A., J.C. Hendee, and J.W. Roggenbuck. 1988. 103 Wilderness Laws: Milestones and Management Direction in Wilderness Legislation, 1964-1987. Idaho Forest, Wildlife & Range Experiment Station, University of Idaho, Moscow, ID.

Franklin, J.F. 1994. Developing information essential to policy, planning, and management decision-making: the promise of GIS. Pages 18-24 in Remote Sensing and GIS in Ecosystem Management (V.A. Sample, editor). Island Press, Washington, D.C.

Landres, P. and S. Meyer. 1998. National Wilderness Preservation System Database: Key Attributes and Trends, 1964 through 1998. USDA Forest Service General Technical Report RMRS-GTR-18, Rocky Mountain Research Station, Fort Collins, CO.

Landres, P.B., S. Marsh, L. Merigliano, D. Ritter, and A. Norman. 1998. Boundary effects on wilderness and other natural areas. Pages 117-139 in Stewardship Across Boundaries (R.L. Knight and P.B. Landres, editors). Island Press, Covelo, CA

Landres, P.B. 1994. The role of ecological monitoring in managing wilderness. Trends 32:10-13.

Lee, K.N. 1993. Compass and gyroscope: integrating science and politics for the environment. Island Press, Washington, D.C.

Reed, P. 1987. National Wilderness Preservation System database I, unit summaries. Fort Collins, CO: Wilderness Research Foundation. 99 p.

Reed, P. 1988. The National Wilderness Preservation System: the first 23 years and beyond. In Wilderness benchmark 1988: proceedings of the national wilderness colloquium. General Technical Report SE-51 (H.R. Freilich, compiler). Asheville, NC: U.S.D.A. Forest Service, Southeastern Forest Experiment Station. 2-20.

Rosenberg, K.A. 1994. Wilderness preservation: A Reference Handbook. ABC-CLIO Publishers, Denver, CO.

U.S. Board on Geographic Names. 1978. Decision Notice 7803. Reston, VA: U.S. Geological Survey.

U.S. Public Law 88-577. The Wilderness Act of 1964 September 3, 1964. 78 Stat. 890.

U.S. Public Law 98-321. Wisconsin Wilderness Act of 1984. June 19, 1984. 98 Stat. 250.

U.S. Public Law 98-425. California Wilderness Act of 1984. September 28, 1984. 98 Stat. 1619.

U.S. Public Law 104-333. Omnibus Parks and Public Lands Management Act of 1996. November 12, 1996. 110 Stat. 4093.

U.S. Public Law 105-82. Act of November 13, 1997. 111 Stat. 1540.

Figure and Table Captions

TABLE 1. Description of the components of each spreadsheet in the 1998 NWPS Database.

FIGURE 1. The cumulative yearly total number of wilderness units within the NWPS managed by the four federal agencies with wilderness responsibility. Data reported in this figure include additions to already designated units, and only lists years that acreage was added; years in which legislation only made name changes or acreage deletions are not included.

FIGURE 2. The cumulative yearly total number of acres within the NWPS managed by the four federal agencies with wilderness responsibility. Data reported in this figure do not include second agency acreage if that agency was not specified in that year=s public law.

FIGURE 3. Comparison of each agency=s current total wilderness acres with that agency=s total land holdings.